



BG Kurt S. Story

Deputy Commanding General for Operations
U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command



Space Cadre, the Warfighter's “Samurai Sword”

The authentic Japanese sword is special. It is carefully made from specialized metal which consists of a hard, high carbon steel and a tough, low carbon steel to take advantage of the best attributes of both. The high-carbon steel is harder and holds a sharper edge, but is brittle and may break in combat. The low-carbon steel is more malleable, making it able to absorb impacts without breaking, but it cannot hold a sharp edge. The two steels are forged together and heated and hammered over a period of several days. Then the steel is folded and hammered up to 16 times to squeeze the impurities out. This lamination effect strengthens the blade (hard steel) while simultaneously keeping it soft enough (soft steel) not to break on impact. The balance has to be just right.

The sword maker coats the blade with several layers of wet clay slurry, a special concoction unique to each maker. The edge of the blade is coated with a thinner layer than the sides and spine of the sword. It is then heated to an exact temperature and quenched in water or oil. The clay slurry provides heat insulation so that only the blade's edge will be hardened with quenching. This also gives the blade its unique curve which adds to the cutting power.

After the blade is forged, it is sent to be polished by hand. The polisher uses finer and finer grains of polishing stones until the blade has a mirror finish. This process can take between one to three weeks and makes the blade extremely sharp and reduces drag making it easier to cut with and more lethal.¹

The three-step process used to produce these ancient instruments of war can also be applied to members of the Space Cadre. For example, “made from two kinds of steel and with a special technique” could translate into combining space operations technical training with basic branch military skills and understanding of basic warfighting principles. The “special techniques” of deployments and the practical and personal combat experience act as the hammer and anvil to force the impurities out and to form a strong and flexible space professional. The special slurry to make the instrument's edge strong and lethal with a unique curvature might translate into a mixture of space operational assignments at different organizational levels that can sharpen the professional's space skills and instill the seasoned judgment to advocate for space capabilities and to know when to apply them for maximum effect. Finally, education and training polish the space Warfighter's skills and acumen like the finer and finer grains of polishing stones create the mirror finish on the samurai sword.

It might be interesting to think of the approximately 2,500 space warriors as the “samurai swords” of the Army bringing their own cutting edge capabilities to the battlefield to empower and enable joint warfighters. But it is more important to consider how to take care of the Space Cadre as one would a samurai sword so that the Cadre remains relevant and keeps its sharp edge.

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2010		2. REPORT TYPE		3. DATES COVERED 00-00-2010 to 00-00-2010	
4. TITLE AND SUBTITLE Space Cadre, the Warfighter's 'Samurai Sword'				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Space and Missile Defense Command/Army Strategic Forces Command,Future Warfare Center,1330 Inverness Drive, Suite 440, Colorado Springs,CO,80910				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 3	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

If the capabilities delivered by space systems truly enable warfighters and their fighting systems, then it is imperative that either the systems remain accessible or that a backup plan is in place to provide the capabilities.

Tomorrow's Mission

The 21st century Army must continue to prevail across the full spectrum of conflicts, a spectrum that stretches from stable peace on one end to unstable peace and counterinsurgency operations and all the way to outright war on the other.² In an era of persistent conflict, American military forces will operate under conditions of uncertainty and complexity. The units will maneuver over larger swaths of territory than ever before and will need to be versatile, expeditionary, agile, lethal and sustainable.

The past eight years have taught the Army that it must be able to operate in a decentralized fashion. Our current enemy operates within a decentralized manner – this means that we must as well. Missions in the foreseeable future will be carried out more often than not at the lowest levels with fewer Soldiers. So, while the objective may be set by higher headquarters, the execution and success of the mission will be decentralized and will fall to units or Soldiers down the chain.³

As a result, small-group leaders need the assured communications, ISR (intelligence, surveillance, and reconnaissance), and real-time situational awareness, capabilities that formerly were located at the higher headquarters. This need to command, control, and inform forces at subordinate levels across greater distances implicates complex and multi-tiered networks on which information travels. It also impacts the space-based assets and their enabling capabilities, the ground stations that speed satellite data on its way, and the cyberspace that connect the two. Space and cyber capabilities will continue to enable almost everything the Army does and ensuring that they are available will tax space operators.

The Intersection of Space and Cyberspace

Space and cyber domains are each global warfighting domains in which distinctive space and cyber military activities are conducted. Both [space and cyber] generate effects in and through their own domains, and across the other domains (e.g. air, land, and maritime). Cyber and space share networked systems and associated physical infrastructures.⁴

Since the cyber domain links space assets to the ground and because that domain inherently relies upon space assets as a component of Department of Defense networks, we must acknowledge the threat our systems, networks, and forces face

in this realm. For example, satellite communications (SATCOM) present a potential avenue of approach for a computer network attack. Hackers could use such access to exploit the confidentiality or to degrade the availability and integrity of the system. A computer network attacks targeted against SATCOM systems could affect a capability carried on the system, e.g., missile warning, which in turn could affect the availability of the transmission capabilities and the mission.

Relevance

Uncertainty and complexity and small unit operations supported by netcentric assets susceptible to cyber attacks and interference provide an opportunity for space professionals to display their relevance. If the capabilities delivered by space systems truly enable warfighters and their fighting systems, then it is imperative that either the systems remain accessible or that a backup plan is in place to provide the capabilities. As discussed in the last Journal, I expect space operators to mitigate any loss of space assets by using the P.A.C.E. (primary, alternate, contingency, and emergency) process to delineate the space systems that tie into the unit and to designate the backups should the system fail.

A corollary to the P.A.C.E. process is the Joint Spectrum Interference Resolution process.⁵ This process has been designed to require units and Soldiers who experience measuring, electromagnetic intrusion or electromagnetic jamming to complete an interference report and attempt to resolve the problem at the lowest level feasible. This necessitates that one recognize that systems are being interfered with. The next step is to search for, discover, and mitigate it and the system vulnerabilities.

Any interference needs to be reported. The Joint Spectrum Interference Resolution process adds to the overall situational awareness on the cyber electromagnetic battleground, which includes space. Too often interference is wished or wargamed away as “another blue-on-blue event” and it goes unreported. As a result, no action is taken. We must change our old habits and investigate every incident of interference and treat them as hostile until proven otherwise. In cases of suspected hostile interference with satellites, ground control sites, and associated user terminals, the report is forwarded up the chain to the Joint Spectrum Center or to U.S. Strategic Command for further action.⁶

Samurai Sword >> page 16

Why does this process matter? As already mentioned our military is increasingly reliant on cyberspace, space, and electromagnetically enabled capabilities. If the equipment using or delivering those capabilities doesn't work as it should, our ingenious Soldiers will find a work around. That's good news and bad news. The good news is that they are able to figure out what the alternate, contingency and emergency⁷ backups are and still enjoy mission success. The bad news is that the Soldier-solutions may be more vulnerable to interception and disruption. If the interference is not reported and the causes are not analyzed, technically sound, standardized solutions to the problem at the enterprise level cannot be developed. Commanders and their signal officers need to enforce reporting any interference through the Joint Spectrum Interference Resolution process, and space professionals must play a part in and support that effort. Doing so can help keep our space-based systems accessible, pinpoint system vulnerabilities, and mitigate their loss. This proactive approach combined with the forensics of Joint Spectrum Interference Resolution will help keep space assets, space operations and space operators relevant.

Maintaining the Edge

Professionals who want to maintain their relevance, their edge, and the acute ability to ply their trade need not look further than the professional development opportunities offered within the military and the Army specifically. For example, as already mentioned, the myriad of space-related assignments at various unit levels are like the special slurry that can sharpen one's skills. The variety hones one's skills as well as broadens one's vision and appreciation of what the possibilities are for the space operations field. By serving in different positions one can develop important partnerships with fellow Army warriors, space professionals from the other Services, and industry specialists that can lead to discovering ways to move Army space operations forward. Therefore, seek out a variety of jobs in a variety of organizations.

Seek other avenues and venues for educating and training. This is another way to whet one's worth. For example, one FA40 starts the new space operations PhD program this summer. Another is starting his Training with Industry at Johns Hopkins University Applied Physics Lab (or Lockheed-Martin). They saw the opportunities and applied for the programs. Like Nike says, "Just do it."

Seek out and make time during or between assignments to take advantage of the institutional training offered by U.S. Army Space and Missile Defense Command/Army Forces Strategic Command's Future Warfare Center (FWC) schoolhouse: FA40 senior course via the U.S. Air Force National Security Space Institute's Space 300 Course⁸, the Tactical Space Operations

Course that support Operation Iraqi Freedom and Operation Enduring Freedom rotations, and the 3-week Space Operating System Course for training on space software analytical tools. This assumes that most of the Space Cadre will have attended either the 10-week FA40 Space Operations Officer Qualification Course or the Army Space Cadre Basic Course. If you don't have one of those courses under your belt, get it.

FWC Directorate of Combat Developments is working on a new course designed for senior FA40s that is geared to further polish their abilities. It will be designed to be a "capstone" class much like those offered by the senior service college. The ideas for course content are still being debated and considered, but some of the possibilities include dialogue with the USASMDC/ARSTRAT commanding general and deputy on vision for space operations and capabilities, instruction on the Army Space Enterprise and how the Army runs, and exchanges with some of the most senior, seasoned Space Operations Officers. This will be an outstanding course. Look for it in the coming year.

Conclusion

Each sword crafted by a master with great care using special materials and techniques. Each sword unique and vital to the success of the samurai warrior who faithfully serves the emperor.

Much like the samurai sword, each space professional is assessed and educated with great care using special materials and techniques. Each professional has the power to bring cutting edge, space-enabling capabilities to defeat the adversary across the full spectrum of conflict. Each professional is unique and vital to the success of joint warriors who faithfully serve the Nation's call.

Basic military skills, technical skills, assignments, education, training, and a continuous process of professional growth meld together to create a space professional that is sharp and focused on assuring space capabilities for Warfighters.

Endnotes

- ¹ <http://en.wikipedia.org/wiki/Katana> and <http://www.samurai-sword-site.com/Japanese-Sword-Making.php>
- ² The Army Capstone Concept, TRADOC Pamphlet 525-3-0, 21 December 2009, 10.
- ³ General Martin E. Dempsey, "The Army Capstone Concept and Institutional Adaptation," Landpower Essay, No. 10-1, The Institute of Land Warfare, March 2010, 3.
- ⁴ USASMDC/ARSTRAT D3SOE Warfighter Seminar Final Report, 29 May 2010, 19.
- ⁵ This requirement is spelled out in Joint Spectrum Interference Resolution, CJCSI 3320.02D, 9 January 2009.
- ⁶ Joint Spectrum Interference Resolution, CJCSI 3320.02D, 9 January 2009, A-4.
- ⁷ PACE – primary, alternate, contingency, emergency. As a standard operating procedure, units should identify their critical systems (weapons, communication, logistical, medical, etc.) After identifying the critical systems, they should designate the alternate, contingency, emergency backups should the primary system be disabled. PACE should be published within the unit.
- ⁸ The Army Space Personnel Development Office manages the allocations for this course rather than FWC DCD.